

**REGION 1 NATIONAL WILDLIFE REFUGE SYSTEM
INVENTORYING & MONITORING PROGRAM**

**ANNUAL REPORT
FY 2011**

**DIVISION OF NATURAL AND CULTURAL RESOURCES
BRANCH OF REFUGE BIOLOGY**

OCTOBER 2011

1. Introduction

1.1 Vision, Goals, and Objectives for the Region 1 I&M Initiative

This report describes implementation of the Region 1 (R1) I&M program during FY2011. The purpose of the NWRS I&M program is to collect and synthesize information which supports management at multiple geographic scales and informs decisions at all organizational levels. The vision of the I&M program is to address the NWRS Mission critical information needs and to help plan and evaluate the effectiveness of conservation strategies implemented by the Service and its conservation partners in the face of accelerating climate change and growing threats from other environmental stressors. The I&M program is being developed to integrate with and support the Service's landscape conservation efforts such as Landscape Conservation Cooperatives (LCCs) and implementation of Strategic Habitat Conservation (SHC).

The NWRS I&M program is based on three documents: *Strategic Plan for Inventories and Monitoring on National Wildlife Refuges: Adapting to Environmental Change (Strategic Plan)*; *Operational Blueprint for Inventories and Monitoring on National Wildlife Refuges – Adapting to Environmental Change (Operational Blueprint)*; and *Addendum to the Strategic Plan (Addendum)*. The *Strategic Plan* provides background and rationale for the NWRS I&M program as well as summarizes and provides a long-term perspective. The *Operational Blueprint* describes how the nationally coordinated program will be implemented during FYs 2010 and 2011 to support I&M activities at national, regional, LCC, and refuge scales. The *Operational Blueprint* also establishes the initial structure of the I&M program and identifies priority tasks to be initiated during Phase 1 (FYs 2010 and 2011). The *Addendum* details the organizational structure, budget allocations and administration, and staffing for the program at the national (Fort Collins) and regional levels.

1.2 Region 1 I&M Initiative Organization and Emphasized Work Areas

In order to provide the greatest benefit, the R1 I&M program focussed efforts where there were overlaps among national, regional, and refuge priorities (Figure 1). National direction is derived from NWRS I&M program as well as NWRS and FWS priorities. The regional priorities are being identified by Service programs and LCC leadership teams in support of trust resource (NWRS Resources of Concern) and other high-priority wildlife and habitat management/conservation issues in R1. At the refuge level, needs identified through the CCP process (goals and objectives) as well as other landscape issues influencing refuge management are identifying priorities for each refuge's I&M activities. For each refuge, the I&M program supports implementation of adaptive management by evaluating achievement of refuge goals and objectives. During development of the I&M program in R1 during FY2011, we focussed on overlapping priorities at all three levels to provide the greatest benefit from the program. The R1 I&M staff collaborated with personnel from other Service divisions (Refuge Biology, Migratory Birds, Fisheries, Fire, Endangered Species, Water Resources, and Planning) so I&M activities had multiple benefits within the region as they relate to providing assistance to refuges.

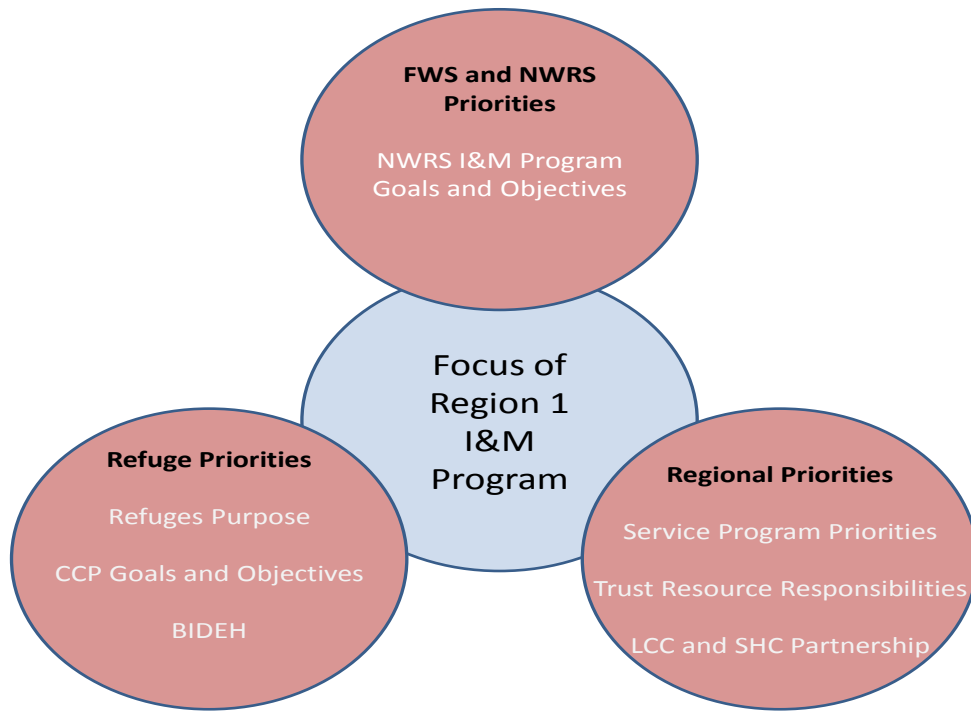


Figure 1. The Region 1 I&M program relative to initiatives of the NWRS as well as other Service Divisions.

The regional I&M program approach for FY 2011 included a strong educational and organizational component and supported Phase 1 tasks under objectives identified in the *Operational Blueprint*. Each LCC in R1 was staffed with a Zone I&M biologist, who invested time with field staffs to learn about the NWRS, its history and current conservation/management initiatives, strategic plans (including CCPs), and relevant policy and handbooks. Zone I&M Biologists and Regional Office-based I&M Specialist (located in Honolulu) familiarized themselves with refuge resource management issues as well as developed working relationships with refuge staffs. Each refuge has special needs depending on its resources of concern, environmental conditions, and management challenges. I&M field biologists are becoming familiar with the diverse array of resource management issues to effectively support the I&M program activities on refuges within LCCs as we develop the NWRS program. Specific products and technical support identified below (see Tables 1 and 2) were the outcome of efforts during FY2011.

The development and implementation of the R1 I&M program continues to be an iterative (adaptive) process. I&M program activities during FY2011 were based upon long-term NWRS program goals stepped down to short-term objectives with associated work products as articulated in this FY's annual work plan. Given the size, accessibility, and complexity for Hawaiian Islands, we recognize the need for flexibility in deliverables and other work products within this geographic area. Many I&M program activities and initiatives started during FY2011 (e.g., refuge I&M planning); however, they will be on-going into the future. Our regional I&M

program is NWRS centric, but it is not refuge exclusive. Collaborative efforts where priorities and needs overlap likely provide information for other Service programs as well as LCCs.

1.3 Integration of I&M with the Regional Refuge Biology and Other FWS Programs

During FY 2011, R1 I&M program staff emphasized building relationships with the Regional Refuge Biology staff as well as other FWS programs (Fire, Invasives, DEQ, Water Resources, and Planning). By building these relationships, we intended to enhance support directly to refuge staffs for their resource management programs and needs. Specific examples include the following:

- Funded a SWCA contract for a GIS technician to assist refuge staffs in mapping hazardous fuels treatment perimeters and entering them into NFPORS. This technician is also developing metadata for implementation surveys (e.g., fire behavior, fuels, weather, smoke) that also is required for entry into NFPORS;
- Funded an Allied GIS contract for a GIS specialist to develop and integrate spatial data layers for wetland infrastructure, water flow maps, water control structure inventorying, points of diversion for water rights, and impaired waters. These data are being used by Water Resources Branch to prepare WRIA reports and HGMs for R1 NWRs;
- Coordinated with Regional Pollinator Coordinator to develop and implement select invertebrate inventories on refuges;
- Provided assistance to CCP planning teams with development and review of resource goals and objectives, management strategies (including I&M surveys), and alternatives;
- Participated on refuge wildlife and habitat management reviews; and
- Provided assistance to refuge staffs with I&M protocol development and implementation as well as analyses and reporting of legacy datasets.

2. Public Interest Highlights

We utilized a request for proposals (RFP) process to select and fund refuge I&M projects (see Table 1). Given the budget constraints at the field station level, this program initiative was well received by R1 refuge staffs. We received 45 proposals totaling approximately \$1.9M from R1 NWRs under the RFP that was distributed to the field during February 2011. Of the submitted proposals, over \$815K of program funding was allocated to 21 selected projects. Funded projects addressed a diverse array of I&M needs including sea level rise modeling for remote islands, biotic inventories (e.g., listed plants, pollinators, native fishes), abiotic data layer acquisition (LiDAR) and water budgets, and monitoring biological response to restoration projects and potential impacts of refuge uses (e.g., fireworks disturbance to nesting seabirds).

Along with addressing current refuge-specific information needs and building relationships with refuge staffs, these projects provide a mechanism to build the I&M program because they are generating protocols and database applications as part of their implementation. For example, Jenny Barnett (Zone I&M Biologist) worked with USGS staff to develop a successful funding proposal through the R1 Quick Response Program (QRP) to survey select refuges for bat hibernacula concentrating on known caves, mines, and rocky cliff faces. R1 I&M program funding was used to purchase acoustic bat detection equipment for refuges, where Jenny is

providing assistance to refuge staffs with field work. Identification of winter habitat set the stage for refuge staffs to conduct future monitoring for early detection of white-nose syndrome.

3. Staffing

The current six I&M staff members for R1 (Appendix 1) came to the program during FY2010 and early FY2011. We enhanced capacity to support refuge I&M work activities by allocating program funding for contract work as previously described in Section 1.3. Specifically, contracts were established with Allied GIS and SWCA to collaborate with the Water Resources Branch and the Fire Program, respectively, in the Regional Office to support preparation of WRIA reports, preparation for hydrogeomorphic modeling (HGMs), and mapping required for hazardous fuels treatments on refuges.

Fred Pavaglio, the Regional Refuge Biologist (RRB) since 1989, retired at the end of December 2010. The vacant RRB position was converted and then advertised as a RRB/Division Chief with supervisory responsibilities over Assistant RRBs, Regional I&M Program staff, and Cultural Resources Branch staff. Because of budget concerns in the foreseeable future, a regional decision was made not to hire the RRB/Division Chief position during FY2012. As a result, the Deputy NWRS Chief (Ben Harrison) will continue to serve as acting RRB/Division Chief along with his new duties and responsibilities as Deputy NWRS Chief.

FY2011 was the first full year for R1 I&M program implementation. During early FY2011, we conducted a workshop in Vancouver for all newly hired R1 I&M staff to develop a clear understanding amongst the team of the long-term direction for the program and the short-term implementation as articulated in our FY2011 work plan. For this program to be successful in Region 1, I&M program staff must work collaboratively to address the core principles for the NWRS program while addressing the regional (including LCC) and refuge-specific needs.

Considering the complexity and geographic extent of resources on refuges and monuments within Pacific Islands and the geographic area of the Pacific Islands Climate Change Cooperative (PICCC), the R1 I&M Specialist position (Jean Kenyon) is located in Honolulu. In addition to supporting development and implementation of the refuge-specific program, Jean has broader responsibilities including coordination with PICCC staff and its steering committee. She is responsible for LCC products (e.g., species-habitat models) where they overlap with NWRS and FWS priorities as well as providing scientific information developed through the NWRS I&M program that supports development of the PICCC. Because NWRS I&M and PICCC are developing concurrently, Jean spent considerable effort assisting with development of the NWRS I&M program (e.g., coordinating with other agencies for large-scale monitoring of NWRS marine resources, development of monitoring approaches for marine systems, site visits to refuges, collecting available I&M data, identifying refuge program priorities). Jean supported the FWS PICCC staff with development of priorities and approaches for implementation of this cooperative.

Please refer to the organizational chart in Appendix 1. All R1 I&M program personnel staff are listed below.

Regional office-based I&M staff:

Kevin Kilbride -- Regional I&M Coordinator

Erin Stockenberg -- Regional I&M Data Manager

Jean Kenyon - I&M Specialist

Pacific Islands Climate Change Cooperative:

Jared Underwood – Zone I&M Biologist

North Pacific LCC:

Brian Root – Zone I&M Biologist

Great Northern and Great Basin LCCs:

Jenny Barnett – Zone I&M Biologist

4. Accomplishments - Activities and Products

This section highlights and summarizes the achievements of R1 I&M program staff during FY 2011, which are detailed in Tables 1 and 2. Table 1 summarizes accomplishments by the major areas of focus (*Operational Blueprint* tasks) for the R1 I&M program; whereas, Table 2 lists specific work activities under four main groupings (Conferences, Workshops, Trainings, and Meetings; Refuge I&M Reviews; Reports, Publications, Presentations; and Technical Support).

I&M program staff work activities during FY2011 encompassed projects that addressed 13 of the 15 initial resource-oriented I&M tasks identified in the *Operational Blueprint* (see Table 1). One of the tasks not addressed by R1 I&M staff pertained to the vulnerability of Arctic refuge lands (Task 6A). Although the fire regime shifts task (Task 2B) was not considered in R1 during FY 2011, it will be addressed during FY 2012. Specifically, we will be providing review and technical consultation on R1 Fire Management Program's development of its web-based mapping tool with information about impacts analysis for the habitat types most frequently subjected to prescribed fire treatments. This tool will be modeled after the FWS Lands Mapper (Cadastral Program), which will allow users to access impacts analysis reports and overlay fire-related spatial data with refuge boundaries.

As depicted in Figure 1, the R1 I&M program staff during FY 2011 emphasized efforts to maximize overlaps among national, regional, and refuge priorities.

Recognizing existing priorities for refuge staffs with daily resource management and on-going planning (CCPs), field I&M staff made maximum use of available opportunities to engage refuge staffs. Field I&M staffs made site visits to R1 refuges so they could begin to comprehend the breadth and complexity of resource management issues on individual field stations to support long-term I&M program development. Many site visits were directed toward I&M needs assessments to assist refuge staffs with initiating development of a list of surveys for a refuge's I&M plan (Part 1 based upon the draft policy). For Part 1 of a refuge I&M plan, current and needed surveys were identified that support station-specific resource management along with

addressing the regional conservation issues for priority resources like migratory birds and listed species. Along with needs assessments, site visits by I&M field staff were focused on assisting R1 NWRs with station-specific issues relating I&M to refuge management including the following:

- Analyzing and reporting of legacy I&M data collected on refuges, where some of these efforts resulted in peer reviewed papers;
- Developing and implementing I&M protocols;
- Distributing I&M program funds to support refuge I&M projects through a process that involved soliciting proposals under a RFP, reviewing and selected proposals, and then providing limited assistance with contracting and/or purchasing. Refuge staffs, who prepared the proposals and interfaced with contractors (where applicable), are responsible for final project reports.
- Supporting contracted resource management initiatives (including HGMs and WRIAs) that will provide valuable scientific information to support resource management decisions and refuge planning;
- Supporting development of CCPs, especially resource management goals and objectives, management strategies (including I&M activities), and alternatives; and
- Participating on refuge wildlife and habitat management reviews.

Table 2 provide details regarding the specific work activities by I&M program staff associated with the previously mentioned and other work activities during FY2011. I&M personnel engaged refuge staffs to build positive working relationships, gain understanding of refuge-specific resource management issues, and assist refuge staffs with addressing their specific scientific information needs as a basis for long-term development of the I&M program that supports adaptive management at the refuge level.

Work activities throughout FY2011 by R1 I&M staff were also geared toward strategic building of working relationships with other Regional Office programs, which provide technical support to refuges. The following summarizes these I&M work activities to enhance support from the regional Refuge Biology, Fire, Water Resources, Migratory Birds, Fisheries, and Refuge Planning programs.

- *Refuge Biology*
 - I&M program funded and administered a contract with Alsea Geospatial (Corvallis, OR) to develop the beta version of the Refuge Habitat Management Database (RHMD). This application is specifically designed to facilitate adaptive management associated with refuge habitat objectives (CCP). For R1, the RHMD is intended to fulfill requirements for a step-down HMP and annual habitat work planning as required by 620 FW 1. RHMD also stores results of I&M activities to evaluate achievement of habitat management objectives. The database will be beta tested with a small number of refuges during FY 2012.
 - R1 I&M program funded and supported region-wide pollinator inventories on many R1 NWRs. This I&M effort is being led by Joe Engler, Regional Pollinator Coordinator. Erin Stockenberg (I&M Data Manager) created a MS Access database for storing and reporting of this pollinator inventory data.
 - Brian Root participated on a wildlife and habitat management review for Dungeness NWR. During the review, Brian gained an understanding of refuge management issues,

interacted with other federal and state biologists working with the refuge staff, and identified I&M activities for key resource management issues.

- *Fire*
 - A GIS technician position was jointly funded under contract by the R1 Fire and I&M programs to assist refuge staffs with perimeter mapping and other metadata for hazardous fuels treatments (required for entry into NFPORS) and developing standard prescribed fire surveys (smoke, weather, and fire behavior) for inclusion into Part 1 of an I&M plan for R1 NWRs.
 - This GIS technician is assisting refuges with entry of hazardous fuels shape files into the geodatabase structure associated with RLGIS.
 - This technician is assisting refuge staffs with pre-population of PRIMR (database storing a refuge's list of surveys) to expedite and facilitate refuge I&M planning.
- *Water Resources*
 - A GIS specialist was jointly funded under contract by the Water Resources Branch (Engineering) and R1 I&M program to support development and integration of spatial data layers (wetland infrastructure, water flow, water rights, and impaired waters) into a RLGIS geodatabase for individual R1 NWRs. During FY 2011, water-related spatial data layers were created or enhanced for 13 R1 NWRs (Table 2). These data are being used to prepare WRIA reports for R1 NWRs as well as support implementation of HGMs for 5 R1 NWRs.
- *Migratory Birds*
 - Brian Root and Kevin Kilbride collaborated with R1 Migratory Bird staff to develop and implement a coordinated census of wintering Canada goose in western Oregon and Washington. This coordinated survey involved conducting fly off counts on major roost areas on refuge, state (ODFW and WDFW), and private lands.
 - Brian Root managed and analyzed the data and then prepared a report summarizing the goose census for Migratory Birds staff and state partners.
- *Fisheries*
 - I&M program staff participated in a joint Fisheries-NWRS Workshop to discuss future opportunities for fisheries and other native aquatic species monitoring in Region 1. We also discussed developing a pilot project to test I&M methods to evaluate aquatic health in refuge waters that could be used to evaluate future impacts of climate change and other stressors.
- *Refuge Planning*
 - R1 I&M program staff participated as core and extended team members for CCPs. Specifically, I&M program staff assisted with the development and/or review of resource management alternative chapters with meaningful contributions regarding resource management goals and objectives, management strategies, and alternatives. In particular, I&M staff assist with identification of I&M activities to evaluate achievement of CCP objectives to facilitate adaptive management.
 - In some cases, I&M staff provide additional assistance with CCP development. For example, Jean Kenyon is assisting with preparing narratives for Affected Environment chapters (Biological and Physical) for the Rose Atoll NWR CCP. This assistance is important given the recent retirement of a long-term marine ecologist in the Honolulu Office.

In total, collaborative efforts were intended to integrate the I&M program with other regional office programs to enhance existing support to refuge staffs for their on-the-ground resource management efforts.

In addition to support at the field-station and regional levels, the R1 I&M program provided support for national (Fort Collins) I&M program initiatives during FY 2011. The following summarizes R1 engagement in nationally identified high-priority I&M initiatives:

- *Water Quality/Water Quantity*
 - Kevin Kilbride coordinated with research scientists from USGS-BRD (CERC) to prepare a project proposal for developing a handbook and assessment tool to evaluate potential effects to species and habitats from existing and potentially new refuge water supplies. This proposal was funded by the national I&M program (\$194K) and was started at the end of the FY. This assessment tool will build upon and enhance an Excel-based tool recently created by the same PIs to assess acceptability for use of treated wastewater and biosolids on refuge lands. In conjunction with this new project, Kevin discussed with WO staff (Craig Moore and George Noguchi) the potential to integrate analyses results from the completed water quality assessment tool into the on-line CAP database as a mechanism to enhance database output reports evaluating contaminant issues for surface and ground water sources for a refuge. Analytical results from the water quality assessment tool could also be integrated into the WRIA database, refuge WRIA reports, and HGMs in the future.
 - Kevin is the FWS project manager for on-going work with USGS-BRD PIs to access the best available and highest resolution EPA/state impaired and assessed waters (303d, 305b, and TMDL) data derived under the Clean Water Act. These data will likely be integrated into the WRIA database and refuge WRIA reports as well as refuge HGMs. Kevin also discussed with WO staff (Craig Moore and George Noguchi) the potential to integrate these water quality data within the CAP database.
 - Results of a pilot study evaluating impaired waters in Oregon and Washington was published in the June issue of the FWS *Journal of Fish and Wildlife Management*.
- *Phenology*
 - Field I&M staff are identifying phenological surveys that are relevant to refuge management during site visits to conduct needs assessments for preparing refuges' lists of surveys in PRIMR (Part 1 of each refuge's I&M plan).
 - Kevin coordinated with the refuge biologist at Ridgefield NWRC to complete the refuge phenological survey originating from the national I&M program.
- *GRAS*
 - Erin and Kevin reviewed and commented on the design of the GRAS pilot methodology.
 - Erin and Kevin identified Malheur NWR as a R1 NWR to participate in this nationally coordinated pilot project.
 - Erin is working with the Malheur NWR staff to prepare legacy documents, maps, and other materials for the week-long pilot project work at the refuge during Nov 2011.
- *PRIMR*
 - R1 I&M staff developed much of the initial documentation and supporting materials (user manual, handbook, FAQs, and Powerpoint presentations) for conducting needs assessment to assist refuge staffs in identifying prioritized lists of refuge surveys.

- Erin developed a MS Access database (Refuge I&M Planning DB) to store surveys for Part 1 of a refuge I&M plan. Erin worked with I&M staff from other regions to enhance the database to address a diversity of other information needs connected with refuge surveys. The enhanced MS Access database was used by Fort Collins staff to develop PRIMR.
- Along with the other Data Managers, Erin conducted extensive testing of PRIMR and identified issues and enhancements before it was made available for use by refuge staffs.
- Erin worked in conjunction with field I&M staff to migrate survey records for R1 NWRs from the original MS Access database to PRIMR.
- Erin provided PRIMR data for select R1 NWRs to FC staff in order to test query and reporting functionalities of PRIMR
- Through an on-going series of conference calls, Kevin is leading a team (includes all R1 I&M field staff) identifying criteria and methods (use of a Smart Tool) for prioritizing surveys in PRIMR.

5. Budget Narrative and Budget

Base funding available to the R1 I&M program at the beginning of FY 2011 was \$1.175M. Approximately two-thirds through the fiscal year (May) funds were added the program's base, which made the total program budget \$1.973M. Approximately \$809K was spent on the 6 salaried positions in the R1 I&M program. We allocated \$839K to refuge I&M projects (including equipment purchases and contracts) and \$66K to jointly funded contracts for GIS work with the R1 Water Resources Branch and Fire program. An additional \$36K was spent on office space rentals, supplies, travel, and vehicles (fuel, maintenance, and parking). The remainder of I&M program funding was spent in support of other R1 NWRS programs.

6. Appendix

A map of Region 1 NWRs by state and LCC can be found in Appendix 2.

Table 1. Region 1 Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011.

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
ASSEMBLE EXISTING ABIOTIC DATA SETS FOR NWRs LANDS					
1A	Worked with contracted GIS specialist (Melanie Wadsworth) to compile and consolidate refuge-specific abiotic data in refuge geodatabases. Coordinated with Water Resource Branch (ENG) to customize RLGIS feature classes to accept water resource inventory data. These data are being integrated into WRIA reports for R1 NWRs.	Abiotic geospatial data added to RLGIS for 13 Region 1 NWRs (water flow, points of diversion, WCS with invert elevations, impaired waters, wetland names)	Erin Stockenberg	I,R	IP
	During refuge I&M reviews, assessed and evaluated completeness of existing data and identified gaps for abiotic data (see Tasks 1F and 3A below).	Started Part 1 of I&M plan for 13 R1 NWRs	All	I,R	IP
	Continued to coordinate on a multiple phased impaired waters projects with USGS-BRD scientists (PIs), R3 representatives, and Michael Higgins	Manuscript published on impaired waters pilot project for refuges in OR and WA. USGS to deliver geospatial datasets for with most current 303d, 305b, and TMDLs for refuges in OR and WA as well as other states including MN, AR, and AZ.	Erin Stockenberg, Kevin Kilbride	I	IP
	Assisted refuge staffs with contract/scope of work for LiDAR acquisition for 2 R1 NWRs plus QA/QC	LiDAR at appropriate contour resolution for resource mgmt at 2 R1 NWRs	Erin Stockenberg	I	IP
CONDUCT REFUGE HGMs					
1B	Coordinated with HGM contractor to prepare a schedule for and start HGMs for 5 R1 NWRs. Coordinated with national I&M team and HGM contractor to integrate WRIA with HGM processes.	Scope of Work for 5 R1 HGMs	Erin Stockenberg, Kevin Kilbirde	I,R	IP
	Coordinated with refuge staffs and participated in site visits for 2 R1 NWR HGM meetings. Conducted data mining needed to support HGMs. Identified refuges to start additional HGMs during this FY.	Phase 1 HGM kick-off reports completed for 2 R1 NWRs. Excel spreadsheet with HGM biotic and abiotic data for each refuge with HGMs started in R1.	All	I,R	IP
	Worked with refuge staff to initiate HGMs for 2 R1 NWRs during FY2012.	On-going work to complete HGM spreadsheet for 2 HGMs to start on R1 NWRs during early FY2012. Funded new start HGM on R1 NWRs during FY2012.	Kevin Kilbride, Erin Stockenberg, Brian Root, Jenny Barnett	I,R	IP
LEGACY DATA FOR NWRs					

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
1C	Coordinated with national I&M team to evaluate use of GRAS pilot to store existing refuge I&M data, reports, and I&M plans for refuges.	Participated on webinars, conference calls, and meetings evaluating the storage of refuge legacy data	All	I	IR
	During refuge I&M needs assessments, collected information about I&M activities that have been conducted on and adjacent to refuges in the past that represent legacy data (see Tasks 1F and 3A below).	Started Part 1 of I&M plan for 14 R1 NWRs	All	I	C
	Identified R1 NWRs to participate in GRAS pilot project	2 R1 NWRs to participate in GRAS pilot.	Erin Stockenberg, Kevin Kilbride	I	IP
	During refuge needs assessment visits, collected information about historic I&M activities that represent legacy data	Populated PRIMR for R1 NWRs	Jared Underwood, Jean Kenyon, Brian Root, Jenny Barnett	I,R	IP
	Assisted refuge staff with analyzing legacy datasets for seabirds, finches, vegetation, brine flies, lake-level for Laysan Island to evaluate current protocols and population trends.	Report provided to refuge staff and results submitted for peer reviewed publication.	Jared Underwood	I	C,IP
	Assisted refuge staff with analyzing legacy datasets for endangered HI waterbirds at James Campbell NWRs to understand long-term population trends and response to habitat management	Report provided to refuge staff and results in preparation for peer review publication	Jared Underwood	I,O	C
	Initiated project to assist refuge staff to analyze legacy datasets for endangered HI waterbirds on all HI NWRs.	Report provided to refuge staff and results in preparation for peer review publication	Jared Underwood	I,O	C
	Analyzed legacy datasets for coral species inventories in federally protected marine waters under US jurisdiction	Peer-reviewed publication in <i>Journal of Marine Biology</i>	Jean Kenyon	I	C
	Analyzed legacy datasets for coral and other benthic surveys conducted at Rose Atoll and Kingman Reef NWRs	Two peer-reviewed publications in <i>Atoll Research Bulletin</i>	Jean Kenyon	I	C
BIOTIC I&M ON NWRs					
1D	Prepared a RFP and to solicit refuge I&M projects and prioritize for distribution of available program funding.	45 refuge I&M projects for Region 1 refuges with rankings. Memo prepared that identified 21 projects that were selected for funding. Provided assistance with funding documents such as interagency agreements, contracts, and acquisition requests.	All	I,R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
	Coordinated with R1 Pollinator Coordinator to conduct inventories of select invertebrates on refuge lands. Developed Pollinator database (MS Access) to store these data.	Report to be prepared that summarizes results of bee inventories conducted on R1NWRs. Inventory data entered into R1 Pollinator database.	Erin Stockenberg, Kevin Kilbride, Jenny Barnett, Brian Root	I,R	IP
	Coordinated with and assisted refuge staffs to conduct inventory of bat species using select R1 NWRs	Bat inventories started on select refuges in GN and GB LCC.	Jenny Barnett	I,R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
All	<p>Refuge I&M Projects:</p> <p>Conduct inventory of native fishes at Sheldon Hart Mnt NWRC</p> <p>Conduct range-wide inventory of two federally listed plants on R1 NWRs on the westside of Oregon and Washington</p> <p>Spotted frog inventory at Malheur NWR</p> <p>Bull trout spawning survey at Kootenai NWR</p> <p>Develop inventory protocols for Frogs in GN and GB LCCs</p> <p>Inventory of reptile and amphibians on OR Islands NWR</p> <p>Pearl shell mussel monitoring at Willapa NWR</p> <p>Estuary restoration monitoring handbook</p> <p>Tidal range monitoring and analysis for estuary restoration projects at Nisqually NWR</p> <p>Prairie remnant survey at Blackwater RNA for Ridgefield NWR</p> <p>Monitoring fish response to tidal restoration at Bandon Marsh NWR</p>	<p>1st field season completed during summer 2011.</p> <p>Field survey work completed during summer 2011.</p> <p>Report to be generated from contract work.</p> <p>Report to be completed by FWS Fisheries staff</p> <p>Report to be generated from contract work.</p> <p>Report to be generated by UGSG-BRD PIs</p> <p>Report to be generated by refuge staff</p> <p>Estuary restoration monitoring handbook to be generated by UGSG-BRD PIs</p> <p>Report to be generated by UGSG-BRD PIs</p> <p>Mapping and report to be generated by refuge staff</p> <p>Report to be generated by FWS Fisheries staff</p>	<p>All</p> <p>Note: Role of I&M staff was primarily limited to the funding process: developing RFP; reviewing and selecting proposals; and limited assistance in contracting and/or purchasing. Refuge staffs, who prepared the proposals under the RFP and interfaced with contractors (where applicable), are responsible for final reports and projects.</p>	I,R	IP
4C	See I&M projects listed under the Bird Monitoring section below.				
DEVELOP STANDARDIZED VEG MAPPING FOR REFUGE LANDSCAPES					

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
1E	Participated on natl I&M team to develop a range of standards and protocols for veg mapping considering refuge-specific needs for resource management	Participated on regular conference calls for natl veg mapping team	Erin Stockenberg	I	IP
	Under the RFP for refuge I&M projects, reviewed, selected, and provided administrative support to assist refuge staff at Camas NWR with starting a veg mapping pilot project to integrate/crosswalk with refuge habitat mapping as well as HGM and WRIA efforts	Proposal developed for veg mapping project. Report for veg mapping pilot project to be generated by RO Refuge Information Branch staff	Erin Stockenberg, Jenny Barnett	I,R	IP
SUPPORT ADAPTIVE MANAGEMENT					
1F, 3A	Developed a consistent approach to conduct Refuge I&M reviews (needs assessments) to assist refuge staffs in developing Part I of a Refuge I&M Plan.	Data base, user guidance, and other supporting documentation for storing information about current and needed I&M activities for a refuge (Part 1 of I&M Plan).	All	I	C
	Conducted site visits to assist refuge staffs in conducting I&M needs assessment to develop Part 1 of a Refuge I&M Plan	Started Part 1 of I&M plan for 13 R1 NWRs	Jean Kenyon, Jared Underwood, Brian Root, Jenny Barnett	I	IP
	Throughout the entire FY, coordinated with Alsea Geospatial (contractor) to develop a beta version of the Refuge Habitat Mgmt Database (RHMD). Conduct beta testing with select NWRs staffs in Region 1 and other regions for tracking CCP and HMP habitat objectives. Summarize and present results of the beta testing to identify needed enhancements to the develop version 2 of the database for distribution and use by refuge staffs throughout Region 1.	Beta version of RHMD for regional/natl rollout to refuge staffs to facilitate adaptive resource mgmt. Report summarizing enhancements identified during beta testing by region. Considering the extensiveness of comments during beta testing, potentially deliver the second version of RHMD to the NWRs.	All	I	IP
	Provided ongoing technical assistance and guidance on adaptive management especially in terms of CCP development for refuges.	Provide assistance with development of alternatives chapters for R1 NWR CCPs, especially resource management G&Os as well as I&M strategies.	All	I	IP
	Coordinated with Regional Fire staff to standardize hazardous fuels treatment surveys (smoke, fuels, weather, fire behavior, fuels reduction) for R1 I&M Plans (PRIMR). GIS technician (SWCA contract) assisting R1 NWRs with hazardous fuels perimeter mapping and associated metadata entry into NFPORS	Geodatabase files with implementation information regarding hazardous fuel treatments for R1 NWRs. Shape files with fuel treatments for R1 NWRs	All	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
	Under the RFP for refuge I&M projects, reviewed, selected, and provided administrative support to assist the refuge staff for analyzing monitoring data collected for Weather Station Fire Rehabilitation Treatments at Hanford NM	Report to be generated by contractor from data analyses	Jenny Barnett	I,R	IP
	Assisted refuge staff with development of veg survey protocols for Laysan Island NWR	New protocol	Jared Underwood	I	IP
	Assisted refuge staff with development of a photo point protocol for James Campbell NWR	New protocol	Jared Underwood	I	C
	Assisted refuge staff with development of protocol to evaluate herbicide efficacy	Communication	Jared Underwood	I	C
CONDUCT REFUGE WRIAs					
2A	Coordinated with Water Resources Branch (ENG) to schedule and conduct WRIAs on R1 Refuges. See Task 1A (assembling abiotic data sets stored in a geodatabase - RLGIS)	Abiotic geospatial data layers added to RLGIS for 13 Region 1 NWRs to start WRIA reports and support HGM work	Erin Stockenberg, Kevin Kilbride	I,R	IP
	Worked with the natl water team developing water quality assessment tools for WRIA process	WRIA database under development	Kevin Kilbride	I	IP
	Worked with National Water Team, WO-DEQ, USGS-BRD to develop a water quality assessment tool/procedure in conjunction with the WRIA process. Tool will evaluate existing and proposed refuge water supplies.	WQ assessment tool and associated handbook for existing refuge water supplies under development by USGS-BRD PIs	Kevin Kilbride, Erin Stockenberg	I	IP
	Coordinated with hydrologists in Water Resources Branch to draft WRIA reports for R1 NWRs	Started development of WRIA reports for 4 R1 NWRs	Kevin Kilbride, Erin Stockenberg	I	IP
PILOT PROJECTS FOR INVASIVE PLANTS					
3A	Reviewed pilot project protocols for the national invasive species pilot I&M project that is developing a range of protocols for invasive species mapping and monitoring.	Reviewed pilot project protocols.	Kevin Kilbride	I	IP
	Administered the Invasive and Volunteers program for distribution of funding to conduct I&M and mapping activities for invasive species.	Reviewed and selected proposals for funding and implementation on R1 NWRs	Kevin Kilbride	R	I
	Assisted refuge staff with design of mapping activities associated with implementing invasive plant mgmt	New protocol for mapping invasive plants	Jared Underwood	I	IP
ECOSYSTEM VULNERABILITY					
4A	Reviewed Sheldon-Hart Mnt. NWRC Vulnerability Assessment Report. Participated on conference call with NatureServe and refuge staff to discuss comments	Reviewed and provided comments on RVA report	Kevin Kilbride	I	C
	See Task 5A addressing vulnerability of coastal areas to sea level rise and other stressors.				

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
	See Task 2A for conducting WRI&As to assess threats to hydrological processes on the refuge.				
PHENOLOGY					
4B	Coordinated with Ridgefield NWR biologist completed the refuge phenological survey developed by natl office	Coordinated with refuge biologist who completed the refuge phenological survey	Kevin Kilbride	I,R	C
BIRD MONITORING					
4C	Identified a Region 1 representative to participate on natl avian I&M team. Coordinated with landbird monitoring initiative in OR and WA.	Participated on webinars and conference calls. Reviewed documents drafted by team.	Brian Root, Jenny Barnett, Kevin Kilbride	I	C
	Coordinated/participated/supported regionally-based migratory bird inventory and monitoring activities in R1 (e.g., Westside of Cascade coordinated Canada goose survey)	New protocol. Prepared reports summarizing regionally-based migratory bird surveys in R1 on and off refuges on westside of OR and WA.	Brian Root, Kevin Kilbride	I	C
	Refuge I&M Projects:				
	Monitor streaked horn lark use of agricultural lands on Willamette Valley NWRC	Report to be generated from contract work.	All		
	Determine disturbance impacts of fireworks at Coquille Pt seabird colony	Field data collected and refuge staff preparing report	Note: Role of I&M staff was primarily limited to the funding process: developing RFP; reviewing and selecting proposals; and limited assistance in contracting and/or purchasing. Refuge staffs, who prepared the proposals under the RFP and interfaced with contractors (where applicable), are responsible for final reports and projects.	I,R	IP
	Monitor population changes within seabird colonies in response to climate change and other stressors at WA Maritime NWRC	Report to be prepared by refuge biologist			
	Population size of endangered HI ducks and prevalence of mallard hybrids at Hanalei NWR	Report to be prepared by OSU PI			
	Population size of endangered HI ducks and prevalence of mallard hybrids at Hanalei NWR	Report to be prepared by OSU PI			
Changes in avian disease and mosquito vector prevalence at Hakalau NWR: 15 year perspective and assessment of future risk to listed forest birds	Report to be prepared by USGS-BRD PI				
Participated/supported regionally based migratory bird inventory and monitoring activities in HI	Report for improving the protocol	Jared Underwood	I	IP	

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding I=I&M R=Refuges O=Other	Status P=Planned F=Funded IP=In progress C=Completed
	Participated in review of protocol for waterbird and shorebird surveys in HI.	Report for improving the protocol developed and then implemented	Jared Underwood	I	IP
	Reviewed seabird monitoring protocol for Papahanamokuakea NM	Report for improving the protocol	Jared Underwood	I	IP
	Coordinated with Mig Bird Division to assess seabird monitoring for albatross and identify future needs	Report for albatross monitoring	Jared Underwood	I	IP
MODELING OF SEA LEVEL RISE ON COASTAL REFUGES					
5A,5B	Assisted with start up of PICCC funded proposal to model sea level rise impact on James Campbell NWR to develop responsive strategies	Sea level rise maps and models. Workshops to train partners in climate change science and assess assets at risk.	Jean Kenyon	O (PICCC)	IP
	Coordinated and conducted sea level rise workshop for North Pacific LCC. Coordinated with scientists developing proposals to collect data necessary to refine better modeling of sea level rise impacts for coastal OR and WA.	SLR Workshop conducted in Newport, OR on Feb 2011. Report summarizing workshop findings.	Erin Stockenberg, Brian Root	I,R	C
	Under the RFP for refuge I&M projects, reviewed, selected, and provided administrative support for project entitled Predicting the impact of storm waves and sea level rise at Papahanamokuakea NM	Report to be prepared by UGSG-BRD PI	Jean Kenyon, Jared Underwood	I,R	IP
	Participated on Regional Climate Board to develop a coastal adaptation strategy proposal to address sea level rise and other stressors for coastal OR and WA.	Review and finalize proposal for the coastal adaptation strategy address sea level rise	Kevin Kilbride, Erin Stockenberg	I	IP
	Provided oversight of contractor for SLAMM analyses completed for 4 R1 NWRs with an additional 3 NWRs planned for FY 2012	SLAMM reports	Erin Stockenberg	I	IP

Table 2. Region 1 Inventory and Monitoring Program Work Activities Conducted During FY2012.

Blueprint Tasks	Work Activity	Date	I&M Staff
CONFERENCES, WORKSHOPS, TRAININGS, AND MEETINGS			
5A,5B	Participated in Sea-level Rise (SLR) effects workshop attended by 60 participants from North Pacific LCC, including refuge staffs. Erin was co-organizer for this SLR workshop.	Feb 2011	Erin Stockenberg, Brian Root
All	Participated in Joint NWR/Columbia River Fisheries PO annual coordination meeting (Vancouver, WA). Kevin gave overview presentation about I&M program activities relative to fisheries	May 2011	Brian Root, Kevin Kilbride, Erin Stockenberg
5A	Attended "Workshop on Modeling for Estuaries, Climate Change, and Restoration and Conservation Planning" (Newport, OR)	Feb 2011	Brian Root
1E, 1F, 3A	Participated in Sagebrush Monitoring Workshop, GN LCC, Bozeman MT	Aug ,2011	Jenny Barnett
All	Conducted westside NWRs (NP LCC) I&M Kick-off Meeting at Nisqually NWR	Dec 2010	Jenny Barnett, Brian Root, Kevin Kilbride, Erin Stockenberg
All	Conducted eastside NWRs (GN and GB LCCs) I&M Kick-off Meeting at Mid-Columbia River NWRC	Mar 2011	Jenny Barnett, Kevin Kilbride, Brian Root
All	Participated in quarterly PICCC Steering Committee meetings	Nov 2010 - May 2011	Jean Kenyon, Jared Underwood
All	Participated in first meeting of all Regional I&M Coordinators, NRLT, and FC staff to discuss program direction in Fort Collins, CO	Dec 2010	Jean Kenyon, Kevin Kilbride
All	Conducted first annual meeting of all R1 I&M positions to discuss program direction in Vancouver, WA	Jan 2011	All R1 I&M Program Staff
1D,1F,4C	Participated in 2 nd Seabird Tissue Archival and Monitoring Project (STAMP) Long-Range Planning Workshop: Expansion of STAMP in the U.S. Pacific Islands Region	Feb 2011	Jared Underwood, Jean Kenyon
All	Attended Northwestern Hawaiian Islands Science Symposium. Jean delivered oral presentation (see below)	Feb 2011	Jared Underwood, Jean Kenyon
1F,4A	Participated in technical workshop to develop 2 aspects of a Response Plan for Coral Bleaching in the PapahānaumokuākeaMNM. Jean delivered oral presentation (see below)	Feb 2011	Jean Kenyon
4C	Participated in Forest Bird Monitoring Workshop for Oahu Forest NWR	Aug 2011	Jared Underwood, Jean Kenyon
All	Participated in multi-agency workshop to develop vision statements for the Pacific Remote Islands MNM and the Mariana Trench MNM	Aug 2011	Jean Kenyon
All	Participated in Hawaii Conservation Conference in Honolulu. Jean served as conference co-chair and moderator for session on Threatened Marine Species.	Aug 2011	Jean Kenyon, Jared Underwood
All	Participated in NP LCC Science Coordination conference call	Feb 2011	Brian Root
All	Attended "Washington Science in the Service" Conference and moderated 1 of 6 general sessions	May 2011	Brian Root
All	Attended 2 nd Pacific Northwest Climate Science Conference (Seattle, WA)	Sept 2011	Brian Root
All	Participated in Dungeness NWR Wildlife and Habitat Review	Feb 2011	Brian Root
4A	Prepared CCP language regarding climate change and ocean acidification for Dungeness, Willapa, Grays Harbor, and Black River Unit of Nisqually NWRs	Apr-Sep 2011	Brian Root
All	Attended NWRS/WDFW state/regional CCP meeting (Olympia, WA)	May 2011	Brian Root

1B	Participated in HGM kick-off meeting for James Campbell NWR	Feb 2011	Jared Underwood, Jean Kenyon
1B	Participated in HGM kick-off meeting for Camas NWR. Presented overview of I&M program to meeting participants. Assisted with compiling datasets for HGM, as applicable.	Apr 2011	Jenny Barnett
2A	Presented a poster at SETAC Natl meeting on handbook on standards to use wastewater on refuge	Nov 2010	Kevin Kilbride
2A	Presented a poster at SETAC Natl meeting on pesticide assessment process used to review and approve pesticide uses on refuges (considers impacts with surface/ground water quality)	Nov 2010	Kevin Kilbride
Training	Attended USFWS Marine Operators Certification Course & Open Water Course	Sep 2010, Mar 2011	Jean Kenyon Jared Underwood
Training	Attended Vertebrate Pest Management on Islands Workshop, Honolulu	Jan 2011	Jean Kenyon, Jared Underwood
Training	Attended Motorboat Operator's Certification Course (MOCC)	Mar 2011	Brian Root
Training	Attended B3 Aviation Training	Mar 2011	Brian Root, Jared Underwood, Jean Kenyon
Training	Attended A312 Water Ditching & Survival Aviation Training	Apr 2011	Brian Root
Training	Attended NCTC course "Developing and Implementing a Biological Monitoring Program"	Sep 2011	Jean Kenyon
Training	Attended Habitat Management Planning (NCTC Online course)	Mar 2011	Jenny Barnett
Training	Attended GIS Imagery Workshop	Jun 2011	Jared Underwood
Training	Attended NCTC course "Data Analysis I: Statistical Concepts and Procedures Using R"	Aug 2011	Jared Underwood
REFUGE I&M REVIEWS (NEEDS ASSESSMENTS)			
1A, 1C, 1 F, 3A	Made site visits to conduct needs assessments for 6 refuges in the PICCC to initiate development of Part 1 of the I&M plan using PRIMR	Mar – Sep 2011	Jean Kenyon, Jared Underwood
1A, 1C, 1 F, 3A	Made site visits to conduct needs assessments for 8 refuges in the GN and GB LCCs to initiate development of Part 1 of the I&M plan using PRIMR	April– Sep 2011	Jenny Barnett
1A, 1C, 1F, 3A	Made asite visit to a conduct needs assessment for 3 refuges in the NP LCC to initiate development of Part 1 of the I&M plan using PRIMR	Mar 2011	Brian Root
1A, 1C, 1F, 3A	Pre-populated PRIMR database with I&M activities and resource management goals and objectives from completed CCPs and HMPs for 20 R1 NWRs	Aug – Sep 2011	Erin Stockenberg
REPORTS/PUBLICATIONS/PRESENTATIONS			
1D	Prepared a RFP that was distributed for FY11 I&M program funds for refuge I&M projects.	Feb-Jul 2011	All
1D	Prepared a RFP to potentially utilize FY12 I&M Program funds for refuge I&M projects. RFP distributed to field during early FY2012.	Jun-Sep 2011	All
1D	Published a peer-reviewed manuscript entitled Kenyon JC, Maragos JE, Cooper S (2010) Characterization of coral communities at Rose Atoll, American Samoa. <i>Atoll Research Bulletin</i> 586: 1-30.	Dec 2010	Jean Kenyon
1D	Published a peer-reviewed manuscript entitled Kenyon JC, Maragos JE, Wilkinson CB (2010) Characterization of coral communities at Kingman Reef in the remote central Pacific Ocean. <i>Atoll Research Bulletin</i> 584: 1-31.	Dec 2010	Jean Kenyon
1D	Published a peer-reviewed manuscript entitled Kenyon JC, Maragos JE, Fenner D (2011) The occurrence of coral species reported as threatened in federally protected waters of the U.S. Pacific. <i>Journal of Marine Biology</i> , vol. 2011, Article ID 358687, 12 pages. doi:10.1155/2011/358687	Jan 2011	Jean Kenyon
1C	Assisted refuge staff with preparing a technical report: Status and Trends of Endangered Waterbirds on James Campbell NWR	Jan 2011	Jared Underwood

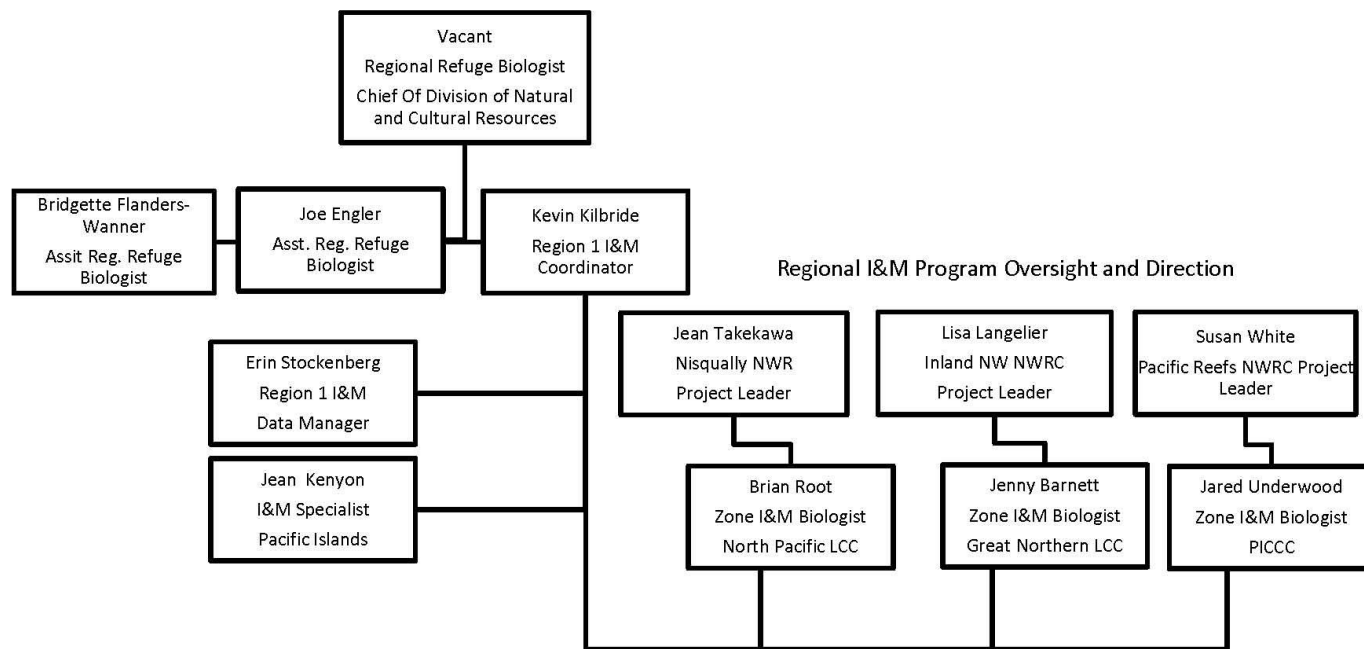
1D	Gave an oral presentation “The distribution and abundance in the NWHI of corals petitioned for listing under the U.S. Endangered Species Act” at NWHI Science Symposium	Feb 2011	Jean Kenyon
1D	Gave an oral presentation, “Bleaching through time in the Northwestern Hawaiian Islands” at PapahānaumokuākeaMNM Bleaching Response Plan Workshop	Feb 2011	Jean Kenyon
	Published a book chapter in the Encyclopedia of Sustainability: Adaptive Resource Management	Feb 2011	Jared Underwood
1A	Refuge I&M Review – Part 1 of the I&M plan initiated for James Campbell, Howland, Baker, Jarvis, Hakalau NWRs, Papahānaumokuākea MNM	Feb-Sept 2011	Jean Kenyon, Jared Underwood
1D	Prepared peer-reviewed manuscript that was accepted for publication: Schopmeyer SA, Vroom PS, Kenyon JC. In press. Spatial and temporal comparisons of benthic composition at Necker Island, Northwestern Hawaiian Islands. Pacific Science	Mar 2011	Jean Kenyon
1C	Prepared a technical report: Status and Trends of Endangered Waterbirds on James Campbell NWR Volume II	Mar 2011	Jared Underwood
1D	Prepared peer-reviewed manuscript that was accepted for publication: Aeby GS, Williams GJ, Franklin EC, Kenyon J, Cox EF, Work TM, Coles S. 2011. Patterns of coral disease across the Hawaiian Archipelago: relating disease to environment. PLoS ONE 6(5): e20370. doi:10.1371/journal.pone.0020370	May 2011	Jean Kenyon
	Prepared a technical report: Monitoring Brine-Flies on Laysan Island, Analysis of Legacy Data to Modify the Protocol	May 2011	Jared Underwood
1C	Prepared a technical report: Status and Trends of Endangered Waterbirds on Pearl Harbor NWR	July 2011	Jared Underwood
1F, 3A	Prepared a technical report: Impacts of severe storms and Tsunami on Laysan Island lake, a historical comparison.	Aug 2011	Jared Underwood
1D	Submitted manuscript to <i>Atoll Research Bulletin</i> : Characterization of coral communities at Wake Atoll in the remote central Pacific Ocean.	Sep 2011	Jean Kenyon
1C	Submitted manuscript to <i>Journal Of Ornithology</i> : Population Status of the Endangered Laysan Finch: Stability in Volatility,	Sep 2011	Jared Underwood
1F, 3A	Preparing manuscript How Climate Change May Impact Pacific Atoll Terrestrial Ecosystems, Global Climate Change Biology	In Prep	Jared Underwood
1F	Prepared RHMD User Guide - “how to” document for data entry and reporting features of the RHMD.	Mar 2011	Erin Stockenberg
2A	Co-authored handbook with water quality assessment tool to evaluate use of treated wastewater and biosolids on refuges	Aug 2010	Kevin Kilbride
2A	Co-authored a manuscript published in <i>Journal of Fish and Wildlife Management</i> “A geospatial approach to identify water quality issues for national wildlife refuges in Oregon and Washington” for a pilot study of impaired waters for refuges in OR and WA	Jun 2011	Kevin Kilbride
All	Prepared a handbook (user guide) and supporting documentation (e.g., FAQs, key messages) for Refuge I&M Reviews Database (transitioned into PRIMR)	Oct 2010-Mar 2011	All
4A	Acted as reviewer and is a FWS collaborator on a North Pacific LCC funded proposal with the USGS and EPA: “Predicting the vulnerability of nearshore species and habitats to climate change effects”	Mar 2011	Erin Stockenberg
4A, 5A	SLR Workshop provided a forum to develop several key partnerships for the I&M Program which resulted in the writing of 3 research proposals submitted to the North Pacific LCC, where one of these proposals was funded.	Feb 2011	Erin Stockenberg, Kevin Kilbride
1E,1F,3A	Assisted refuge staff with preparing a mapping protocol associated with invasive plant management for Hakalau NWR.	Mar 2011	Jared Underwood
1F	Assisted refuge staff with preparing photo-plot monitoring protocol for	May 2011	Jared Underwood

	James Campbell NWR		
1F,4C	Prepared a report recommending improvements for annual waterbirds and shorebird surveys in HI.	Jul 2011	Jared Underwood
1F,4C	Prepared a report recommending improvements for seabird monitoring protocols at Papahānaumokuākea MNM.	Sep 2011	Jared Underwood
All	Conducted site visits and completed site-visit questionnaire for 7 eastside NWRs. Also, briefed refuge staffs on I&M Program: Malheur, Kootenai, Columbia, Little Pend Oreille, Hanford/Saddle Mountain, McNary, and Umatilla NWRs	Mar – Sep 2011	Jenny Barnett
5A	Provided oversight for contractor who completed SLAMM reports for 4 R1 NWRs in NP LCC. Coordinated/planned 3 R1 NWR SLAMM analyses for next FY.	Jun – Sept 2011	Erin Stockenberg
4C	Technical Report: Summary of March 2011 Pilot Goose Fly-off Surveys from Nocturnal Roosts in NW Oregon and SW Washington	May 2011	Brian Root
TECHNICAL ASSISTANCE			
4B	Coordinated with Ridgefield NWR biologist completed the refuge phonological survey developed by natl office	Aug 2011	Kevin Kilbride
1D	Developed and distributed a RFP to R1 Refuge PLs and biologist for FY11 I&M program funds. Reviewed 45 proposals and selected 21 projects for funding (\$815K) with subsequent assistance with funding logistics	Feb-Jul 2011	All
1F	Reviewed and commented on Palmyra Rat Eradication EIS	Nov 2010	Jean Kenyon
1F,4A	Reviewed and commented on RVA for Sheldon Hart Mt NWRC		Kevin Kilbride, Jenny Barnett
All	Participated on 5-member panel to evaluate and prioritize 38 science proposals submitted to PICCC for FY11 funding. Selected 6 proposals totaling ~\$800 K for funding	Apr-May 2011	Jean Kenyon
All	Participated on 5-member Integrated Science Planning team to develop a science planning framework for PICCC	Oct 2010 – Sep 2011	Jean Kenyon
All	Participated on panel to evaluate & select abstracts submitted to Hawaii Conservation Conference and to organize concurrent conference sessions	June-July 2011	Jean Kenyon
All	Judged at Hawaii State Science Fair	March 2011	Jared Underwood
All	Participated on Technical Advisory Team for Oahu Habitat Conservation Plan “Greenprint”	Jan – Sep 2011	Jared Underwood
All	Provided technical assistance for CCPs for Hanalei, Huleia, Kilauea Point, Rose Atoll, Palmyra Atoll, and Kingman Reef NWRs	Jan – Sep 2011	Jean Kenyon, Jared Underwood
All	Supported refuge staffs using the PRIMR database to complete Part 1 of I&M plan for James Campbell, Howland, Baker, Jarvis, and Hakalau NWRs plus Papahānaumokuākea MNM	Feb – Sept 2011	Jean Kenyon, Jared Underwood
All	Supported refuge staffs using the PRIMR database to complete Part 1 of I&M plan for Malheur, Columbia, Kootenai, Saddle Mt, McNary, Umatilla, and Little Pend Oreille NWRs plus Hanford NM	April – Sep 2011	Jenny Barnett
All	Conducted site visit to support Ridgefield NWR staff using the PRIMR database to complete Part 1 of I&M plan	Mar 2011	Brian Root
1B	Provided assistance with data mining and report/publication gathering to HGM contractor and refuge staff to initiate HGMs at James Campbell NWR	Feb 2011	Jean Kenyon, Jared Underwood
1D	With personnel from the Papahānaumokuākea MNM, coordinated development of a press release announcing the first <i>in situ</i> observations of coral spawning in the Northwestern Hawaiian islands.	Jun 2011	Jean Kenyon
4A	Participated in kick-off meeting of Papahānaumokuākea MNM Climate Change Working Group	June 2011	Jean Kenyon
All	Reviewed 26 research permit applications submitted to Papahānaumokuākea MNM and 5 Palmyra Atoll NWR Special Use	Oct 2010-Sep 2011	Jean Kenyon

	Permit applications		
4C	Compiled and summarized data from a March 2011 pilot survey to estimate numbers of wintering Canada, cackling, and other geese at 63 major nocturnal roost sites in NW Oregon and SW Washington. The survey was a collaborative effort including USFWS, Oregon DFW, and Washington DFW, implemented via coordinated, relatively synchronized fly-off counts. Products included an Excel database with metadata & summary tables; ArcGIS spatial datasets; and a summary report provided to USFWS Migratory Birds, ODFW, and WDFW.	Mar-May 2011	Brian Root
4C	Contributed to development of Partners-in-Flight OR/WA bi-state landbird monitoring strategy document (conference calls & meetings; reviewed draft documents)	May-Sep 2011	Brian Root, Jenny Barnett, Kevin Kilbride
1F	Assisted refuge staff with design and pilot implementation of over-wintering waterbird surveys at managed freshwater and restored estuary wetlands at Nisqually NWR, including data summarization (w/ on-going USGS surveys), mapping of vegetation, and development of water elevation models for use in adaptive management decision-making.	Oct 2010 – Sep 2011	Brian Root
1F	Assisted refuge staff conduct a sandhill crane surveys at Conboy Lake NWR	Apr 2011	Brian Root
1F	Assisted refuge staff conduct spring shorebird migration surveys at Grays Harbor NWR	Apr-May 2011	Brian Root
1F	Assisted refuge staff conduct San Juan Islands NWR summer wildlife surveys	Jun 2011	Brian Root
1F	Attended meetings with USGS/ARMI staff to discuss potential amphibian monitoring for R1 NWRs	Jun 2011	Brian Root, Kevin Kilbride
1F	Attended meetings with Klamath Bird Observatory staff to discuss potential landbird monitoring for R1 NWRs	Aug 2011	Brian Root, Kevin Kilbride
4C	Participated in Annual Grays Harbor NWR shorebird festival	May 2011	Brian Root
4C	Participated in Annual Nisqually Watershed Festival at Nisqually NWR	Sep 2011	Brian Root
2A	Coordinated with National Water Team and WO-DEQ to develop a water quality assessment tool for integration in the WRIA process	Jan – Sep 2011	Kevin Kilbride, Erin Stockenberg
All	Participated on PRIMR acceptance team - ongoing technical expertise and guidance as database was adopted by the National I&M Program for use in all regions.	Mar – Sep 2011	Erin Stockenberg, Kevin Kilbride
1F,1D,4C	Participate on national migratory bird I&M team	Oct 2010 – Sep 2011	Jenny Barnett
1B	Coordinated with HGM contractor and refuge staff to initiate HGMs at James Campbell, Camas, Conboy Lake, and Nestucca Bay NWRs and provided assistance data mining and report/publication gathering.	Mar – Sep 2011	All
1A, Data Mgmt	Directed contractor developing the Refuge Habitat Management Database (RHMD) that included conducting extensive product review and testing, providing contractor feedback, and designing a user's manual. RHMD facilitates completion of HMPs and AHWP's as required by NWRS policy 620 FW 1. This database will facilitate implementation of adaptive resource management on all Region 1 NWRs and will facilitate the development of science-based management decisions to improve accomplishment of CCP and HMP objectives.	Oct 2010 – Sep 2011	Erin Stockenberg, Kevin Kilbride
Data Mgmt	Developed R1 Pollenators database to store inventory information regarding invertebrate pollinators (primarily bee species) on refuges; Erin developed the database and provided technical support to R1 Pollinator Coordinator to populate inventory information from R1 NWRs.	Oct 2010 – Sep 2011	Erin Stockenberg
Data Mgmt	Review and comment on the national Geospatially Referenced Archival System (GRAS) pilot	Aug-Sep 2011	Erin Stockenberg, Kevin Kilbride
Data Mgmt	Designed and maintained a Server with SQL Server and ArcGIS in order to secure and centralize R1 I&M databases and other geospatial data	Oct 2011 – Mar 2011	Erin Stockenberg

	investments.		
1A	For LiDAR acquisition contract for Wapato Lake NWR, Erin led proposal review and selection process, conducted multi-agency coordination, managed contract, and provided oversight for on-going operations.	Jun – Sep 2011	Erin Stockenberg, Kevin Kilbride
1A	For LiDAR acquisition contract for Camas NWR, Erin led proposal review and selection process, conducted multi-agency coordination, managed contract, and provided oversight for on-going operations..	Jun – Sep 2011	Erin Stockenberg, Kevin Kilbride
Data Mgmt	Supported for 4 Hydrogeomorphic Modeling (HGM) efforts on R1 NWRs by providing review and oversight on source data layers.	Oct 2010 – Sep 2011	Erin Stockenberg
1E,1F,3A	Represented R1 on the I&M national vegetation mapping team. Erin designed a survey to assess the status of and need for vegetation and habitat maps on refuges, assessing current methodologies, and drafting recommendations for future work.	Oct 2010 – Sep 2011	Erin Stockenberg
All	Developed and managed R1 I&M Sharepoint Site for disseminating critical documents and databases so refuge staffs have ready access to program.	Oct 2010 – Sep 2011	Erin Stockenberg
Data Mgmt	Provided coordination and technical support to hydrologic modeling projects at Camas and Wapato Lake NWRs.	Jun – Sep 2011	Erin Stockenberg
1E, 1F,3A	Provided contracting support and furnished GIS/GPS, specific survey equipment (burrow cameras) to multiple refuges/complexes including: Malheur, Washington Maritime, Willapa, Palmyra, and Laysan Island.	Jun – Aug 2011	Erin Stockenberg
Data Mgmt	Provided process guidance and review to contractor (Allied GIS) regarding map and database product development used to start 13 WRIA reports	Oct 2010 – Sep 2011	Erin Stockenberg, Kevin Kilbride
1F,2B	Provided guidance to Fire Program staff and contracted GIS technician on methods for collecting and managing fire monitoring data and building integration of the various data systems into the workflow and management of fire information.	Oct 2010 – Sep 2011	Erin Stockenberg, Kevin Kilbride
4A,5A	Field trip at James Campbell NWR to initiate implementation of PICCC-funded proposal to model sea level rise impact and develop responsive management strategies	Sep 2011	Jean Kenyon
1D,1E, 1F,3A	Cross-walk and communication tools needed to bridge the gap between NVCS (National Vegetation Classification System) standards and terms and habitat approach taken by many refuges. Assist with descriptions of wildlife habitat value provided by NVCS groups and alliances	Jun – Sep 2011	Jenny Barnett, Erin Stockenberg

Appendix 1: Organization of Region 1 Inventory and Monitoring Program



Appendix 2. National Wildlife Refuges in Region 1 for the North Pacific, Great Basin, and Great Northern LCCs as well as the Pacific Island Climate Change Cooperative (PICCC).

